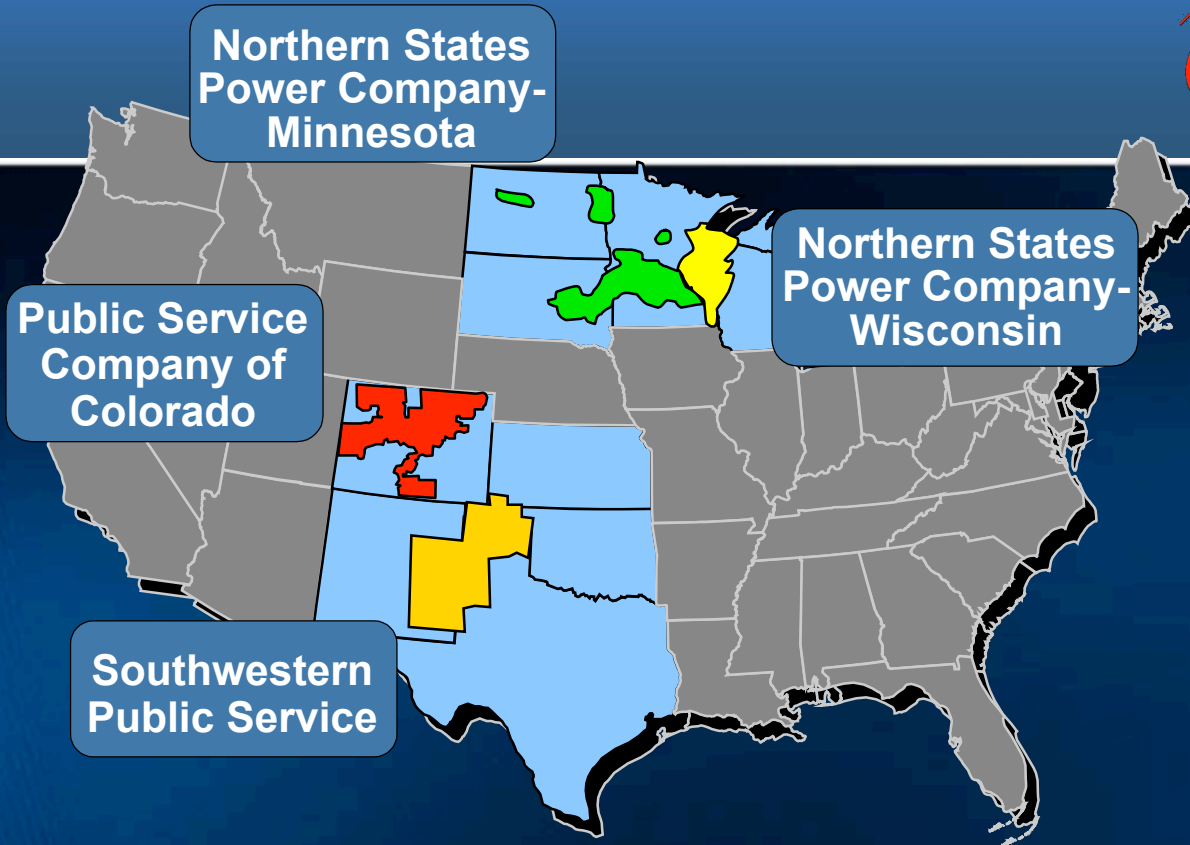


# **Powering Colorado's Future: Xcel Energy Resource Planning**

**Michelle Edwards**

**Manager, Environmental Policy  
Relations**



**4<sup>th</sup> largest US electric  
and gas utility —**

**Customers:**

**3.3 Million Electric**

**1.8 Million Gas**

# Xcel Energy in Colorado

- **1.34 million electric customers**
- **1.25 million natural gas customers**
- **Provides energy to 75% of state's residents**



# Our Energy Future

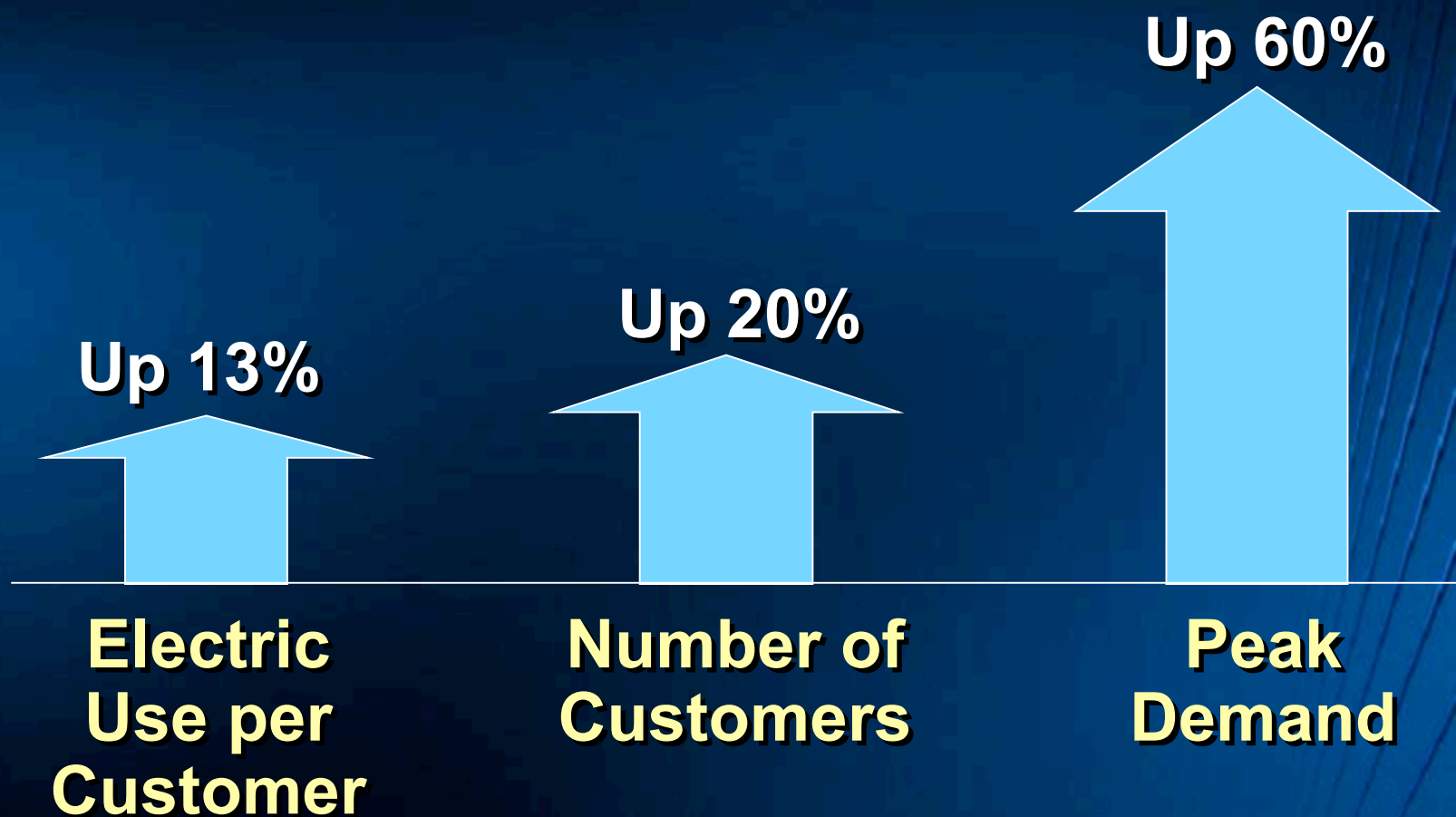
- **Colorado's energy needs are growing**
- **Need a balanced portfolio of resources – including renewable energy and energy efficiency**
- **Must address environmental, price and reliability issues**
- **Resource decisions are long lived**
- **Additional transmission needed**
- **New technology can play a role**



# Colorado's Energy Needs are Growing

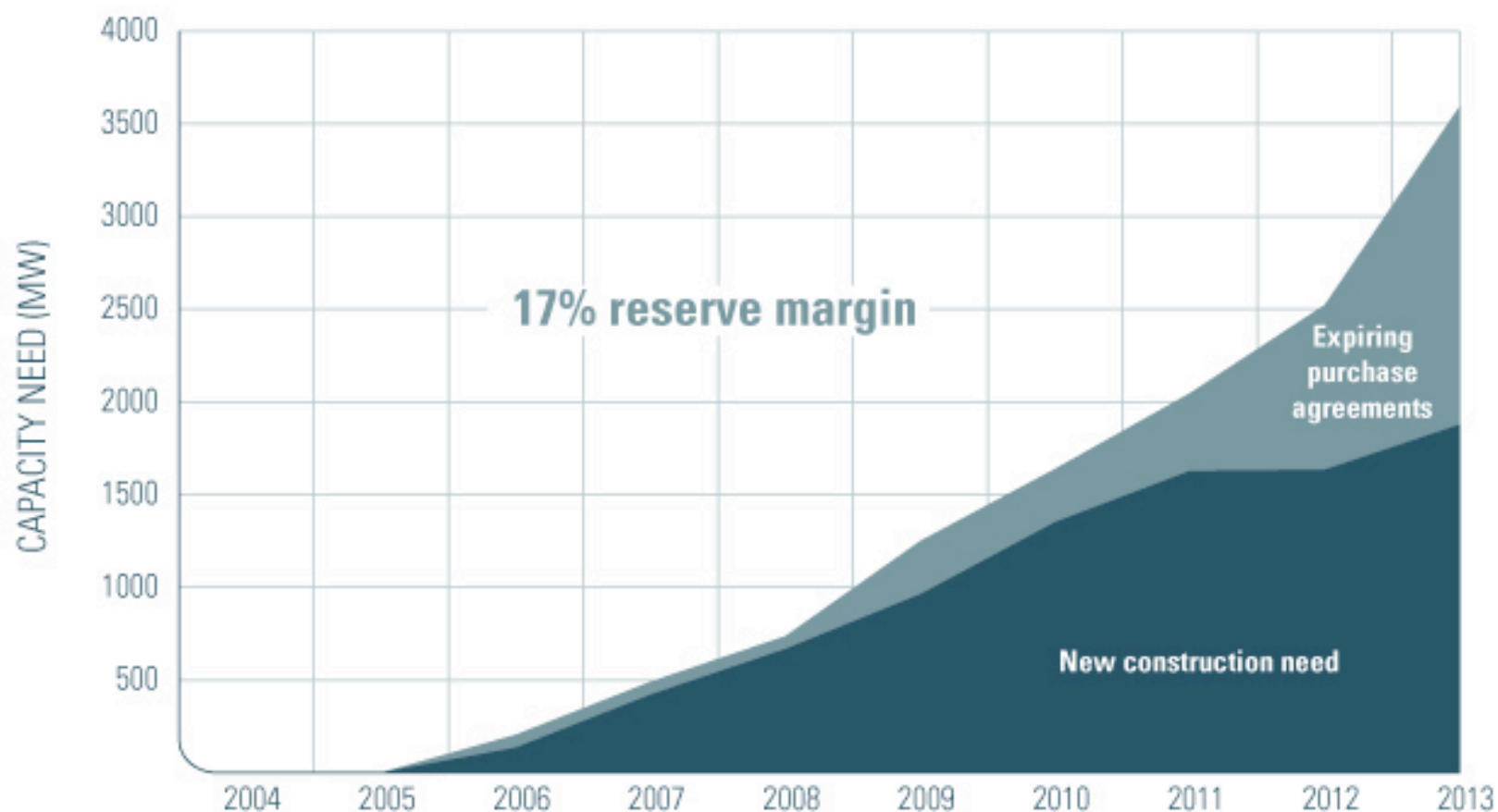


In the last decade:



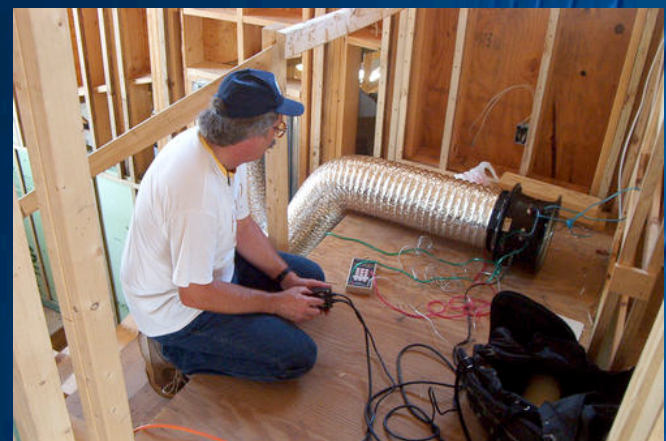
# The Forecast

## Xcel Energy's Colorado Capacity Needs



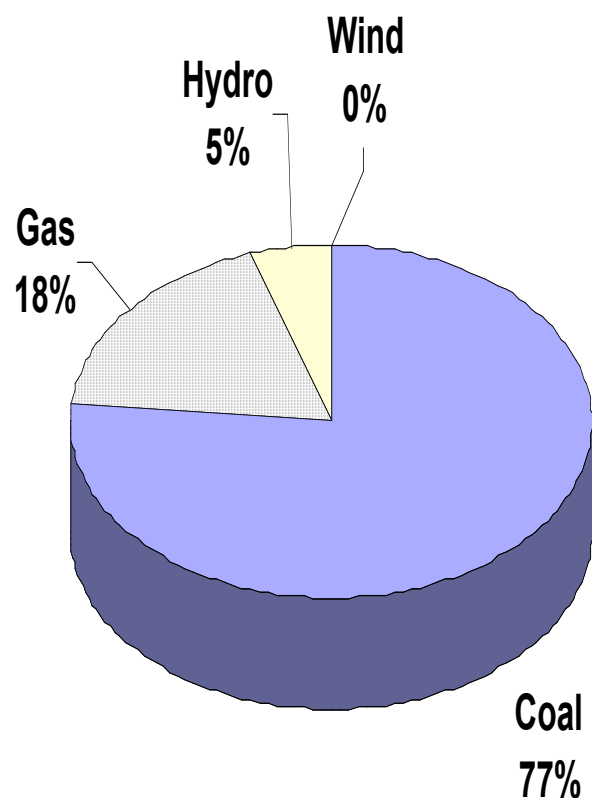
# Energy Resource Options

- Coal
- Natural gas
- Wind
- Hydro
- Energy conservation
- Solar
- Nuclear

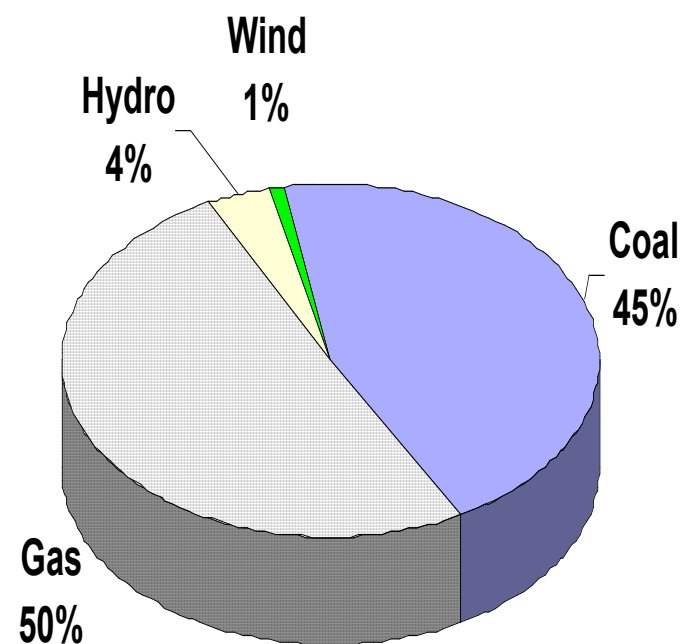


# Colorado's Changing Resource Mix

**1995**



**2004**



# Types of Energy Needs

**Base load – Continuous need for electricity**

**Intermediate - Growing need for electricity**

**Peaking – Highest need for electricity**

**Renewable energy – Intermittent generation**



# Colorado Resource Plan

- **Recently completed and approved by CPUC**
  - Forecast of electric needs for 2004-2013
  - Plan for acquiring electric resources to meet needs
- **Resource acquisition process**
  - Request for proposals:
    - Early renewable RFP
    - All-source RFP
  - 750 MW coal-fired unit at Comanche Station near Pueblo



# Settlement Agreement

- **Reached with many environmental parties (12/04)**
- **Comanche Station**
  - Additional emission controls and tighter emission limits
  - Mercury testing and cost-effective controls for all units; plant-wide mercury emission limit
- **Energy planning**
  - Accept wind bids up to 15% penetration if in least-cost portfolio
  - Wind ancillary cost study
  - Greatly increased energy conservation programs and study
  - New resources evaluated with CO<sub>2</sub> proxy cost and renewable energy credit value
  - Innovative technologies
- **Community initiatives**
  - Pueblo environmental donations and community involvement

# Renewable Energy

- **Evaluating renewable energy bids (RFPs) through Colorado resource planning process**
- **Second largest retail provider of wind energy in US**
  - **938 MW capacity throughout system (almost 250 on CO system)**
  - **Largest voluntary green-pricing program in US (Windsource) – started in Colorado**
  - **Goal – triple wind capacity on system by 2012 (2500 MW)**
- **Developing Amendment 37 implementation plans**
- **Researching technology options (IGCC/solar/wind)**

# Renewable Energy Benefits

- **Hedge against gas price risk and potential environmental regulation**
- **Low-cost energy**
- **Helps meet state renewable portfolio standards**
- **Mitigates risk of future environmental regulation (including carbon)**
- **Business opportunity: Wind in our backyard**

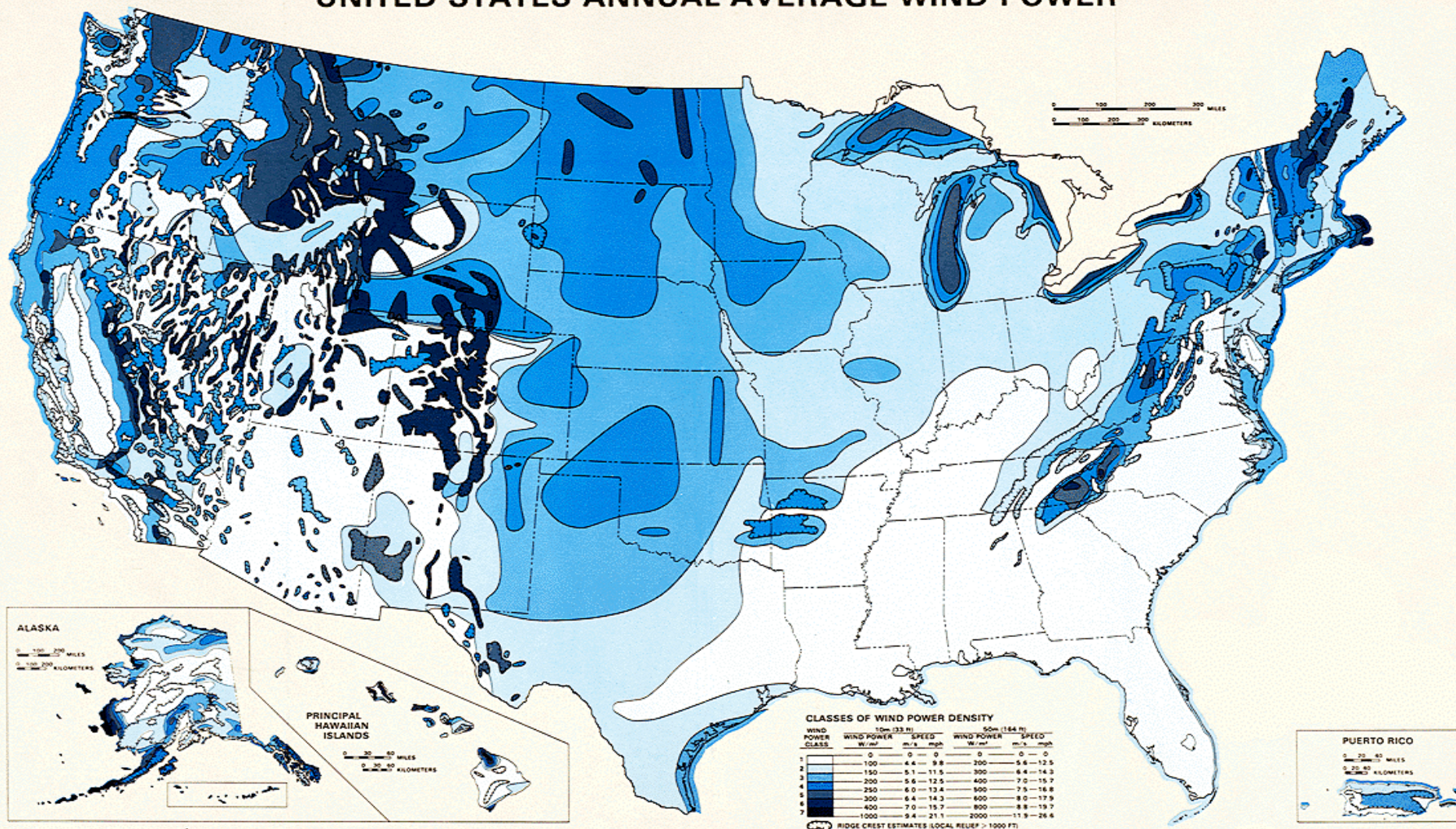




# National wind resources – Xcel Energy's backyard



UNITED STATES ANNUAL AVERAGE WIND POWER





# Amendment 37

- **Colorado renewable portfolio standard**
  - **3% from 2007 - 2010**
  - **6% from 2011 - 2014**
  - **10% by 2015 and thereafter**
  - **4% solar requirement (system and customer-sited)**
- **Developed partial consensus implementation rules with environmental parties**
- **Waiting for rules**



# Renewable Energy Challenges

- **Transmission constraints**
  - **Energy bill contained federal siting authority provision**
- **PTC has been intermittent**
  - **Recently extended through Energy bill – end of 2007**
- **Equipment supply constraints and rising construction costs**
- **Generation intermittency and saturation issues**
- **Ancillary service costs**



# Innovative Technologies

- **Solar**
  - **Amendment 37 requirements**
  - **Large-scale system and customer-sited solar**
  - **Working with National Renewable Energy Lab**
- **IGCC feasibility study - project using western coal at higher altitudes**
  - **Working with Electric Power Research Institute**
- **Compressed air energy storage with wind**



# Carbon Management Strategy

- Voluntary 7% reduction in CO<sub>2</sub> intensity (lbs./MWh) from 2003 levels to 2012 levels
- Reduce total CO<sub>2</sub> emissions from electricity supplied to customers by cumulative total of 12 million tons by 2009 based on 2003 emissions
- 2004 performance – on track to meet goal
- CO<sub>2</sub> emissions lawsuit filed by several states against 5 utilities, including Xcel Energy, recently dismissed by NY judge

